SEQUENCE LISTING

<110> Hruska, Keith A.
McCartney, John E.
Charette, Marc F.

<120> CONJOINT ADMINISTRATION OF MORPHOGENS AND ACE INHIBITORS IN
TREATMENT OF CHRONIC RENAL FAILURE

<130> JJJ-P01-599

<140> 10/650,326
<141> 2003-08-28

<150> 60/406,431
<151> 2002-08-28

<160> 31

<170> PatentIn version 3.2

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<212> PRT
<213> Homo sapiens

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Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro Lys
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Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu Asn Ser Ser Ser
            20   25   30

Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg
        35   40   45

Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala
    50   55   60

Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn
65   70   75   80

Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn Pro
            85   90   95

Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile
            100   105   110

Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr
        115   120   125

Arg Asn Met Val Val Arg Ala Cys Gly Cys His
    130   135

<210> 2
<211> 97
<212> PRT
<213> Homo sapiens

<400> 2

His Arg Arg Leu Arg Ser Gln Glu Arg Arg Glu Met Gln Arg Glu Ile
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Leu Ser Ile Leu Gly Leu Pro His Arg Pro Arg Pro His Leu Gln Gly
            20   25   30

Lys His Asn Ser Ala Pro Met Phe Met Leu Asp Leu Tyr Asn Ala Met
        35   40   45

Ala Val Glu Glu Gly Gly Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro
    50   55   60

Tyr Lys Ala Val Phe Ser Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln
65   70   75   80

Asp Ser His Phe Leu Thr Asp Ala Asp Met Val Met Ser Phe Val Asn
            85   90   95

Leu

<210> 3
<211> 431
<212> PRT
<213> Homo sapiens

<400> 3

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala
1   5   10   15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser
            20   25   30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser
        35   40   45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu
    50   55   60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro
65   70   75   80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly
            85   90   95

Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser
            100   105   110

Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr
        115   120   125

Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys
    130   135   140

Glu Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu
145   150   155   160

Ser Lys Ile Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile
            165   170   175

Tyr Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile
            180   185   190

Ser Val Tyr Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu
        195   200   205

Phe Leu Leu Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu
    210   215   220

Val Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg
225   230   235   240

His Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser
            245   250   255

Ile Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn
            260   265   270

Lys Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe
        275   280   285

Arg Ser Ile Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser
    290   295   300

Lys Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu
305   310   315   320

Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr
            325   330   335

Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu
        340   345   350

Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn
        355   360   365

Ser Tyr Met Asn, Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His
    370   375   380

Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln
385   390   395   400

Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile
            405   410   415

Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            420   425   430

<210>   4
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<212>   PRT
<213>   Mus musculus

<400>   4

Ser Thr Gly Gly Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro Lys
1   5   10   15

Asn Gln Glu Ala Leu Arg Met Ala Ser Val Ala Glu Asn Ser Ser Ser
            20   25   30

Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg
        35   40   45

Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala
    50   55   60

Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn
65   70   75   80

Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn Pro
                85   90   95

Asp Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile
            100   105   110

Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr
        115   120   125

Arg Asn Met Val Val Arg Ala Cys Gly Cys His
    130   135

<210>   5
<211>   139
<212>   PRT
<213>   Homo sapiens

<400>   5

Ala Val Arg Pro Leu Arg Arg Arg Gln Pro Lys Lys Ser Asn Glu Leu
1   5   10   15

Pro Gln Ala Asn Arg Leu Pro Gly Ile Phe Asp Asp Val His Gly Ser
            20   25   30

His Gly Arg Gln Val Cys Arg Arg His Glu Leu Tyr Val Ser Phe Gln
        35   40   45

Asp Leu Gly Trp Leu Asp Trp Val Ile Ala Pro Gln Gly Tyr Ser Ala
    50   55   60

Tyr Tyr Cys Glu Gly Glu Cys Ser Phe Pro Leu Asp Ser Cys Met Asn
65   70   75   80

Ala Thr Asn His Ala Ile Leu Gln Ser Leu Val His Leu Met Lys Pro
                85   90   95

Asn Ala Val Pro Lys Ala Cys Cys Ala Pro Thr Lys Leu Ser Ala Thr
            100   105   110

Ser Val Leu Tyr Tyr Asp Ser Ser Asn Asn Val Ile Leu Arg Lys His
        115   120   125

Arg Asn Met Val Val Lys Ala Cys Gly Cys His
    130   135

<210> 6
<211> 139
<212> PRT
<213> Mus musculus

<400> 6

Ala Ala Arg Pro Leu Lys Arg Arg Gln Pro Lys Lys Thr Asn Glu Leu
1   5   10   15

Pro His Pro Asn Lys Leu Pro Gly Ile Phe Asp Asp Gly His Gly Ser
            20   25   30

Arg Gly Arg Glu Val Cys Arg Arg His Glu Leu Tyr Val Ser Phe Arg
        35   40   45

Asp Leu Gly Trp Leu Asp Trp Val Ile Ala Pro Gln Gly Tyr Ser Ala
    50   55   60

Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asp Ser Cys Met Asn
65   70   75   80

Ala Thr Asn His Ala Ile Leu Gln Ser Leu Val His Leu Met Lys Pro
                85   90   95

Asp Val Val Pro Lys Ala Cys Cys Ala Pro Thr Lys Leu Ser Ala Thr
            100   105   110

Ser Val Leu Tyr Tyr Asp Ser Ser Asn Asn Val Ile Leu Arg Lys His
        115   120   125

Arg Asn Met Val Val Lys Ala Cys Gly Cys His
    130   135

<210> 7
<211> 588
<212> PRT
<213> Drosophila melanogaster

<400> 7

Met Arg Ala Trp Leu Leu Leu Leu Ala Val Leu Ala Thr Phe Gln Thr
1   5   10   15

Ile Val Arg Val Ala Ser Thr Glu Asp Ile Ser Gln Arg Phe Ile Ala
              20   25   30

Ala Ile Ala Pro Val Ala Ala His Ile Pro Leu Ala Ser Ala Ser Gly
              35   40   45

Ser Gly Ser Gly Arg Ser Gly Ser Arg Ser Gly Gly Ala Ser Thr Ser
    50   55   60

Thr Ala Leu Ala Lys Ala Phe Asn Pro Phe Ser Glu Pro Ala Ser Phe
65   70   75   80

Ser Asp Ser Asp Lys Ser His Arg Ser Lys Thr Asn Lys Lys Pro Ser
                  85   90   95

Lys Ser Asp Ala Asn Arg Gln Phe Asn Glu Val His Lys Pro Arg Thr
                  100   105   110

Asp Gln Leu Glu Asn Ser Lys Asn Met Ser Lys Gln Leu Val Asn Lys
          115   120   125

Pro Asn His Asn Lys Met Ala Val Lys Glu Gln Arg Ser His His Lys
    130   135   140

Lys Ser His His His Arg Ser His Gln Pro Lys Gln Ala Ser Ala Ser
145   150   155   160

Thr Glu Ser His Gln Ser Ser Ser Ile Glu Ser Ile Phe Val Glu Glu
                  165   170   175

Pro Thr Leu Val Leu Asp Arg Glu Val Ala Ser Ile Asn Val Pro Ala
              180   185   190

Asn Ala Lys Ala Ile Ile Ala Glu Gln Gly Pro Ser Thr Tyr Ser Lys
              195   200   205

Glu Ala Leu Ile Lys Asp Lys Leu Lys Pro Asp Pro Ser Thr Leu Val
    210   215   220

Glu Ile Glu Lys Ser Leu Leu Ser Leu Phe Asn Met Lys Arg Pro Pro
225   230   235   240

Lys Ile Asp Arg Ser Lys Ile Ile Ile Pro Glu Pro Met Lys Lys Leu
                  245   250   255

Tyr Ala Glu Ile Met Gly His Glu Leu Asp Ser Val Asn Ile Pro Lys
        260   265   270

Pro Gly Leu Leu Thr Lys Ser Ala Asn Thr Val Arg Ser Phe Thr His
        275   280   285

Lys Asp Ser Lys Ile Asp Asp Arg Phe Pro His His His Arg Phe Arg
    290   295   300

Leu His Phe Asp Val Lys Ser Ile Pro Ala Asp Glu Lys Leu Lys Ala
305   310   315   320

Ala Glu Leu Gln Leu Thr Arg Asp Ala Leu Ser Gln Gln Val Val Ala
            325   330   335

Ser Arg Ser Ser Ala Asn Arg Thr Arg Tyr Gln Val Leu Val Tyr Asp
        340   345   350

Ile Thr Arg Val Gly Val Arg Gly Gln Arg Glu Pro Ser Tyr Leu Leu
        355   360   365

Leu Asp Thr Lys Thr Val Arg Leu Asn Ser Thr Asp Thr Val Ser Leu
    370   375   380

Asp Val Gln Pro Ala Val Asp Arg Trp Leu Ala Ser Pro Gln Arg Asn
385   390   395   400

Tyr Gly Leu Leu Val Glu Val Arg Thr Val Arg Ser Leu Lys Pro Ala
            405   410   415

Pro His His His Val Arg Leu Arg Arg Ser Ala Asp Glu Ala His Glu
            420   425   430

Arg Trp Gln His Lys Gln Pro Leu Leu Phe Thr Tyr Thr Asp Asp Gly
        435   440   445

Arg His Lys Ala Arg Ser Ile Arg Asp Val Ser Gly Gly Glu Gly Gly
    450   455   460

Gly Lys Gly Gly Arg Asn Lys Arg Gln Pro Arg Arg Pro Thr Arg Arg
465   470   475   480

Lys Asn His Asp Asp Thr Cys Arg Arg His Ser Leu Tyr Val Asp Phe
            485   490   495

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Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Leu Gly Tyr Asp
            500             505             510


Ala Tyr Tyr Cys His Gly Lys Cys Pro Phe Pro Leu Ala Asp His Phe
            515             520             525


Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn Asn Met Asn
            530             535             540


Pro Gly Lys Val Pro Lys Ala Cys Cys Val Pro Thr Gln Leu Asp Ser
545             550             555             560


Val Ala Met Leu Tyr Leu Asn Asp Gln Ser Thr Val Val Leu Lys Asn
                565             570             575


Tyr Gln Glu Met Thr Val Val Gly Cys Gly Cys Arg
            580             585
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<210>  8
<211>  360
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<213>  Xenopus laevis

<400>  8

Met Val Trp Leu Arg Leu Trp Ala Phe Leu His Ile Leu Ala Ile Val
1               5               10              15


Thr Leu Asp Pro Glu Leu Lys Arg Arg Glu Glu Leu Phe Leu Arg Ser
            20              25              30


Leu Gly Phe Ser Ser Lys Pro Asn Pro Val Ser Pro Pro Val Pro
            35              40              45


Ser Ile Leu Trp Arg Ile Phe Asn Gln Arg Met Gly Ser Ser Ile Gln
    50              55              60


Lys Lys Lys Pro Asp Leu Cys Phe Val Glu Glu Phe Asn Val Pro Gly
65              70              75              80


Ser Val Ile Arg Val Phe Pro Asp Gln Gly Arg Phe Ile Ile Pro Tyr
                85              90              95


Ser Asp Asp Ile His Pro Thr Gln Cys Leu Glu Lys Arg Leu Phe Phe
            100             105             110
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Asn Ile Ser Ala Ile Glu Lys Glu Glu Arg Val Thr Met Gly Ser Gly
        115   120   125

Ile Glu Val Gln Pro Glu His Leu Leu Arg Lys Gly Ile Asp Leu Arg
    130   135   140

Leu Tyr Arg Thr Leu Gln Ile Thr Leu Lys Gly Met Gly Arg Ser Lys
145   150   155   160

Thr Ser Arg Lys Leu Leu Val Ala Gln Thr Phe Arg Leu Leu His Lys
                165   170   175

Ser Leu Phe Phe Asn Leu Thr Glu Ile Cys Gln Ser Trp Gln Asp Pro
            180   185   190

Leu Lys Asn Leu Gly Leu Val Leu Glu Ile Phe Pro Lys Lys Glu Ser
        195   200   205

Ser Trp Met Ser Thr Ala Asn Asp Glu Cys Lys Asp Ile Gln Thr Phe
    210   215   220

Leu Tyr Thr Ser Leu Leu Thr Val Thr Leu Asn Pro Leu Arg Cys Lys
225   230   235   240

Arg Pro Arg Arg Lys Arg Ser Tyr Ser Lys Leu Pro Phe Thr Ala Ser
            245   250   255

Asn Ile Cys Lys Lys Arg His Leu Tyr Val Glu Phe Lys Asp Val Gly
        260   265   270

Trp Gln Asn Trp Val Ile Ala Pro Gln Gly Tyr Met Ala Asn Tyr Cys
        275   280   285

Tyr Gly Glu Cys Pro Tyr Pro Leu Thr Glu Ile Leu Asn Gly Ser Asn

    290   295   300

His Ala Ile Leu Gln Thr Leu Val His Ser Ile Glu Pro Glu Asp Ile
305   310   315   320

Pro Leu Pro Cys Cys Val Pro Thr Lys Met Ser Pro Ile Ser Met Leu
            325   330   335

Phe Tyr Asp Asn Asn Asp Asn Val Val Leu Arg His Tyr Glu Asn Met
        340   345   350

Ala Val Asp Glu Cys Gly Cys Arg

     355   360

<210> 9
<211> 438
<212> PRT
<213> Mus musculus

<400> 9

Met Arg Lys Met Gln Lys Glu Ile Leu Ser Val Leu Gly Pro Pro His
1   5   10   15

Arg Pro Arg Pro Leu His Gly Leu Gln Gln Pro Gln Pro Pro Val Leu
            20   25   30

Pro Pro Gln Gln Gln Gln Gln Gln Gln Gln Gln Thr Ala Arg Glu
        35   40   45

Glu Pro Pro Pro Gly Arg Leu Lys Ser Ala Pro Leu Phe Met Leu Asp
    50   55   60

Leu Tyr Asn Ala Leu Ser Asn Asp Asp Glu Glu Asp Gly Ala Ser Glu
65   70   75   80

Gly Val Gly Gln Glu Pro Gly Ser His Gly Gly Ala Ser Ser Ser Gln
                85   90   95

Leu Arg Gln Pro Ser Pro Gly Ala Ala His Ser Leu Asn Arg Lys Ser
            100   105   110

Leu Leu Ala Pro Gly Pro Gly Gly Gly Ala Ser Pro Leu Thr Ser Ala
            115   120   125

Gln Asp Ser Ala Phe Leu Asn Asp Ala Asp Met Val Met Ser Phe Val
    130   135   140

Asn Leu Val Glu Tyr Asp Lys Glu Phe Ser Pro His Gln Arg His His
145   150   155   160

Lys Glu Phe Lys Phe Asn Leu Ser Gln Ile Pro Glu Gly Glu Ala Val
                165   170   175

Thr Ala Ala Glu Phe Arg Val Tyr Lys Asp Cys Val Val Gly Ser Phe
            180   185   190

Lys Asn Gln Thr Phe Leu Ile Ser Ile Tyr Gln Val Leu Gln Glu His
        195   200   205

Gln His Arg Asp Ser Asp Leu Phe Leu Leu Asp Thr Arg Val Val Trp
        210   215   220

Ala Ser Glu Glu Gly Trp Leu Glu Phe Asp Ile Thr Ala Thr Ser Asn
225   230   235   240

Leu Trp Val Val Thr Pro Gln His Asn Met Gly Leu Gln Leu Ser Val
                245   250   255

Val Thr Arg Asp Gly Leu His Val Asn Pro Arg Ala Ala Gly Leu Val
        260   265   270

Gly Arg Asp Gly Pro Tyr Asp Lys Gln Pro Phe Met Val Ala Phe Phe
        275   280   285

Lys Val Ser Glu Val His Val Arg Thr Thr Arg Ser Ala Ser Ser Arg
    290   295   300

Arg Arg Gln Gln Ser Arg Asn Arg Ser Thr Gln Ser Gln Asp Val Ser
305   310   315   320

Arg Gly Ser Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala
            325   330   335

Cys Lys Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln
        340   345   350

Asp Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly
        355   360   365

Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala
    370   375   380

Ile Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys
385   390   395   400

Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe
            405   410   415

Asp Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val
            420   425   430

Arg Ala Cys Gly Cys His
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<212> DNA
<213> Homo sapiens

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tgcccgacac tgagacgctg ttcccagcgt gaaaagagag actgcgcggc cggcacccgg   180

gagaaggagg aggcaaagaa aaggaacgga cattcggtcc ttgcgccagg tcctttgacc   240

agagttttc catgtggacg ctctttcaat ggacgtgtcc ccgcgtgctt cttagacgga   300

ctgcggtctc ctaaaggtcg accatggtgg ccgggacccg ctgtcttcta gcgttgctgc   360

ttccccaggt cctcctgggc ggcgcggctg gcctcgttcc ggagctgggc cgcaggaagt   420

tcgcggcggc gtcgtcgggc cgcccctcat cccagccctc tgacgaggtc ctgagcgagt   480

tcgagttgcg gctgctcagc atgttcggcc tgaaacagag acccacccct agcagggacg   540

ccgtggtgcc ccctacatg ctagacctgt atcgcaggca ctcaggtcag ccgggctcac   600

ccgccccaga ccaccggttg gagagggcag ccagccgagc caacactgtg cgcagcttcc   660

accatgaaga atctttggaa gaactaccag aaacgagtgg gaaaacaacc cggagattct   720

tctttaattt aagttctatc cccacggagg agtttatcac ctcagcagag cttcaggttt   780

tccgagaaca gatgcaagat gctttaggaa acaatagcag tttccatcac cgaattaata   840

tttatgaaat cataaaacct gcaacagcca actcgaaatt ccccgtgacc agacttttgg   900

acaccaggtt ggtgaatcag aatgcaagca ggtgggaaag ttttgatgtc accccgctg   960

tgatgcggtg gactgcacag gacacgcca accatggatt cgtggtggaa gtggcccact   1020

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atgaacacag ctggtcacag ataaggccat gctagtaac ttttggccat gatggaaaag   1140

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agtccagctg taagagacac cctttgtacg tggacttcag tgacgtgggg tggaatgact   1260

ggattgtggc tcccccgggg tatcacgcct tttactgcca cggagaatgc ccttttcctc   1320

tggctgatca tctgaactcc actaatcatg ccattgttca gacgttggtc aactctgtta   1380

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<210>  11
<211>  1751
<212>  DNA
<213>  Homo sapiens

<400>  11
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gcttgtctcc ccgatgggat tcccgtccaa gctatctcga gcctgcagcg ccacagtccc    180

cggccctcgc ccaggttcac tgcaaccgtt cagaggtccc caggagctgc tgctggcgag    240

cccgctactg cagggaccta tggagccatt ccgtagtgcc atcccgagca acgcactgct    300

gcagcttccc tgagcctttc cagcaagttt gttcaagatt ggctgtcaag aatcatggac    360

tgttattata tgccttgttt tctgtcaaga caccatgatt cctggtaacc gaatgctgat    420

ggtcgtttta ttatgccaag tcctgctagg aggcgcgagc catgctagtt tgatacctga    480

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gagccatgag ctcctgcggg acttcgaggc gacacttctg cagatgtttg ggctgcgccg    600

ccgcccgcag cctagcaaga gtgccgtcat tccggactac atgcgggatc tttaccggct    660

tcagtctggg gaggaggagg aagagcagat ccacagcact ggtcttgagt atcctgagcg    720

cccggccagc cgggccaaca ccgtgaggag cttccaccac gaagaacatc tggagaacat    780

cccagggacc agtgaaaact ctgctttttcg tttcctcttt aacctcagca gcatccctga    840

gaacgaggtg atctcctctg cagagcttcg gctcttccgg gagcaggtgg accagggccc    900

tgattgggaa aggggcttcc accgtataaa catttatgag gttatgaagc ccccagcaga    960

agtggtgcct gggcacctca tcacacgact actggacacg agactggtcc accacaatgt   1020

gacacggtgg gaaactttttg atgtgagccc tgcggtcctt cgctggaccc gggagaagca   1080

gccaaactat gggctagcca ttgaggtgac tcacctccat cagactcgga cccaccaggg   1140

ccagcatgtc aggattagcc gatcgttacc tcaagggagt gggaattggg cccagctccg   1200

gcccctcctg gtcacctttg gccatgatgg ccggggccat gccttgaccc gacgccggag   1260

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gcgccactcg ctctatgtgg acttcagcga tgtgggctgg aatgactgga ttgtggcccc   1380

accaggctac caggccttct actgccatgg ggactgcccc tttccactgg ctgaccacct   1440
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agatcaggca gtccttgagg atagacagat atacacacca cacacacaca ccacatacac    1680

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<210> 12
<211> 472
<212> PRT
<213> Homo sapiens

<400> 12

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                20                  25                  30


Arg Lys Ala Val Pro Gly Asp Arg Thr Ala Gly Gly Gly Pro Asp Ser
        35                  40                  45


Glu Leu Gln Pro Gln Asp Lys Val Ser Glu His Met Leu Arg Leu Tyr
    50                  55                  60


Asp Arg Tyr Ser Thr Val Gln Ala Ala Arg Thr Pro Gly Ser Leu Glu
65                  70                  75                  80


Gly Gly Ser Gln Pro Trp Arg Pro Arg Leu Leu Arg Glu Gly Asn Thr
                85                  90                  95


Val Arg Ser Phe Arg Ala Ala Ala Glu Thr Leu Glu Arg Lys Gly
                100                 105                 110


Leu Tyr Ile Phe Asn Leu Thr Ser Leu Thr Lys Ser Glu Asn Ile Leu
        115                 120                 125


Ser Ala Thr Leu Tyr Phe Cys Ile Gly Glu Leu Gly Asn Ile Ser Leu
    130                 135                 140


Ser Cys Pro Val Ser Gly Gly Cys Ser His His Ala Gln Arg Lys His
145                 150                 155                 160
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Ile Gln Ile Asp Leu Ser Ala Trp Thr Leu Lys Phe Ser Arg Asn Gln
            165   170   175

Ser Gln Leu Leu Gly His Leu Ser Val Asp Met Ala Lys Ser His Arg
            180   185   190

Asp Ile Met Ser Trp Leu Ser Lys Asp Ile Thr Gln Phe Leu Arg Lys
            195   200   205

Ala Lys Glu Asn Glu Glu Phe Leu Ile Gly Phe Asn Ile Thr Ser Lys
    210   215   220

Gly Arg Gln Leu Pro Lys Arg Arg Leu Pro Phe Pro Glu Pro Tyr Ile
225   230   235   240

Leu Val Tyr Ala Asn Asp Ala Ala Ile Ser Glu Pro Glu Ser Val Val
            245   250   255

Ser Ser Leu Gln Gly His Arg Asn Phe Pro Thr Gly Thr Val Pro Lys
            260   265   270

Trp Asp Ser His Ile Arg Ala Ala Leu Ser Ile Glu Arg Arg Lys Lys
            275   280   285

Arg Ser Thr Gly Val Leu Leu Pro Leu Gln Asn Asn Glu Leu Pro Gly
    290   295   300

Ala Glu Tyr Gln Tyr Lys Lys Asp Glu Val Trp Glu Glu Arg Lys Pro
305   310   315   320

Tyr Lys Thr Leu Gln Ala Gln Ala Pro Glu Lys Ser Lys Asn Lys Lys
            325   330   335

Lys Gln Arg Lys Gly Pro His Arg Lys Ser Gln Thr Leu Gln Phe Asp
            340   345   350

Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Glu Pro Arg
            355   360   365

Asn Cys Ala Arg Arg Tyr Leu Lys Val Asp Phe Ala Asp Ile Gly Trp
    370   375   380

Ser Glu Trp Ile Ile Ser Pro Lys Ser Phe Asp Ala Tyr Tyr Cys Ser
385   390   395   400

Gly Ala Cys Gln Phe Pro Met Pro Lys Ser Leu Lys Pro Ser Asn His
            405   410   415

Ala Thr Ile Gln Ser Ile Val Arg Ala Val Gly Val Val Pro Gly Ile
            420   425   430

Pro Glu Pro Cys Cys Val Pro Glu Lys Met Ser Ser Leu Ser Ile Leu
            435   440   445

Phe Phe Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met
        450   455   460

Thr Val Glu Ser Cys Ala Cys Arg
465   470

<210>   13
<211>   372
<212>   PRT
<213>   Homo sapiens

<400>   13

Met Pro Pro Pro Gln Gln Gly Pro Cys Gly His His Leu Leu Leu Leu
1   5   10   15

Leu Ala Leu Leu Leu Pro Ser Leu Pro Leu Thr Arg Ala Pro Val Pro
            20   25   30

Pro Gly Pro Ala Ala Ala Leu Leu Gln Ala Leu Gly Leu Arg Asp Glu
            35   40   45

Pro Gln Gly Ala Pro Arg Leu Arg Pro Val Pro Pro Val Met Trp Arg
        50   55   60

Leu Phe Arg Arg Arg Asp Pro Gln Glu Thr Arg Ser Gly Ser Arg Arg
65   70   75   80

Thr Ser Pro Gly Val Thr Leu Gln Pro Cys His Val Glu Glu Leu Gly
            85   90   95

Val Ala Gly Asn Ile Val Arg His Ile Pro Asp Arg Gly Ala Pro Thr
            100   105   110

Arg Ala Ser Glu Pro Val Ser Ala Ala Gly His Cys Pro Glu Trp Thr
            115   120   125

Val Val Phe Asp Leu Ser Ala Val Glu Pro Ala Glu Arg Pro Ser Arg
   130   135   140

Ala Arg Leu Glu Leu Arg Phe Ala Ala Ala Ala Ala Ala Pro Glu
145   150   155   160

Gly Gly Trp Glu Leu Ser Val Ala Gln Ala Gly Gln Gly Ala Gly Ala
        165   170   175

Asp Pro Gly Pro Val Leu Leu Arg Gln Leu Val Pro Ala Leu Gly Pro
       180   185   190

Pro Val Arg Ala Glu Leu Leu Gly Ala Ala Trp Ala Arg Asn Ala Ser
      195   200   205

Trp Pro Arg Ser Leu Arg Leu Ala Leu Ala Leu Arg Pro Arg Ala Pro
   210   215   220

Ala Ala Cys Ala Arg Leu Ala Glu Ala Ser Leu Leu Leu Val Thr Leu
225   230   235   240

Asp Pro Arg Leu Cys His Pro Leu Ala Arg Pro Arg Arg Asp Ala Glu
        245   250   255

Pro Val Leu Gly Gly Gly Pro Gly Gly Ala Cys Arg Ala Arg Arg Leu
        260   265   270

Tyr Val Ser Phe Arg Glu Val Gly Trp His Arg Trp Val Ile Ala Pro
     275   280   285

Arg Gly Phe Leu Ala Asn Tyr Cys Gln Gly Gln Cys Ala Leu Pro Val
   290   295   300

Ala Leu Ser Gly Ser Gly Gly Pro Pro Ala Leu Asn His Ala Val Leu
305   310   315   320

Arg Ala Leu Met His Ala Ala Ala Pro Gly Ala Ala Asp Leu Pro Cys
       325   330   335

Cys Val Pro Ala Arg Leu Ser Pro Ile Ser Val Leu Phe Phe Asp Asn
      340   345   350

Ser Asp Asn Val Val Leu Arg Gln Tyr Glu Asp Met Val Val Asp Glu
   355   360   365

Cys Gly Cys Arg
    370

<210>   14
<211>   455
<212>   PRT
<213>   Drosophila melanogaster

<400>   14

Met Ser Gly Leu Arg Asn Thr Ser Glu Ala Val Ala Val Leu Ala Ser
1   5   10   15

Leu Gly Leu Gly Met Val Leu Leu Met Phe Val Ala Thr Thr Pro Pro
                20   25   30

Ala Val Glu Ala Thr Gln Ser Gly Ile Tyr Ile Asp Asn Gly Lys Asp
            35   40   45

Gln Thr Ile Met His Arg Val Leu Ser Glu Asp Asp Lys Leu Asp Val
        50   55   60

Ser Tyr Glu Ile Leu Glu Phe Leu Gly Ile Ala Glu Arg Pro Thr His
65   70   75   80

Leu Ser Ser His Gln Leu Ser Leu Arg Lys Ser Ala Pro Lys Phe Leu
                85   90   95

Leu Asp Val Tyr His Arg Ile Thr Ala Glu Glu Gly Leu Ser Asp Gln
                100   105   110

Asp Glu Asp Asp Asp Tyr Glu Arg Gly His Arg Ser Arg Arg Ser Ala
            115   120   125

Asp Leu Glu Glu Asp Glu Gly Glu Gln Gln Lys Asn Phe Ile Thr Asp
        130   135   140

Leu Asp Lys Arg Ala Ile Asp Glu Ser Asp Ile Ile Met Thr Phe Leu
145   150   155   160

Asn Lys Arg His His Asn Val Asp Glu Leu Arg His Glu His Gly Arg
                165   170   175

Arg Leu Trp Phe Asp Val Ser Asn Val Pro Asn Asp Asn Tyr Leu Val
                180   185   190

Met Ala Glu Leu Arg Ile Tyr Gln Asn Ala Asn Glu Gly Lys Trp Leu
    195   200   205

Thr Ala Asn Arg Glu Phe Thr Ile Thr Val Tyr Ala Ile Gly Thr Gly
    210   215   220

Thr Leu Gly Gln His Thr Met Glu Pro Leu Ser Ser Val Asn Thr Thr
225   230   235   240

Gly Asp Tyr Val Gly Trp Leu Glu Leu Asn Val Thr Glu Gly Leu His
                245   250   255

Glu Trp Leu Val Lys Ser Lys Asp Asn His Gly Ile Tyr Ile Gly Ala
            260   265   ·   270

His Ala Val Asn Arg Pro Asp Arg Glu Val Lys Leu Asp Asp Ile Gly
        275   280   285

Leu Ile His Arg Lys Val Asp Asp Glu Phe Gln Pro Phe Met Ile Gly
    290   295   300

Phe Phe Arg Gly Pro Glu Leu Ile Lys Ala Thr Ala His Ser Ser His
305   310   315   320

His Arg Ser Lys Arg Ser Ala Ser His Pro Arg Lys Arg Lys Lys Ser
            325   330   335

Val Ser Pro Asn Asn Val Pro Leu Leu Glu Pro Met Glu Ser Thr Arg
            340   345   350

Ser Cys Gln Met Gln Thr Leu Tyr Ile Asp Phe Lys Asp Leu Gly Trp
            355   360   365

His Asp Trp Ile Ile Ala Pro Glu Gly Tyr Gly Ala Phe Tyr Cys Ser
    370   375   380

Gly Glu Cys Asn Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His
385   390   395   400

Ala Ile Val Gln Thr Leu Val His Leu Leu Glu Pro Lys Lys Val Pro
            405   410   415

Lys Pro Cys Cys Ala Pro Thr Arg Leu Gly Ala Leu Pro Val Leu Tyr
            420   425   430

His Leu Asn Asp Glu Asn Val Asn Leu Lys Lys Tyr Arg Asn Met Ile
     435   440   445

Val Lys Ser Cys Gly Cys His
     450   455

<210> 15
<211> 454
<212> PRT
<213> Homo sapiens

<400> 15

Met His Leu Thr Val Phe Leu Leu Lys Gly Ile Val Gly Phe Leu Trp
1   5   10   15

Ser Cys Trp Val Leu Val Gly Tyr Ala Lys Gly Gly Leu Gly Asp Asn
         20   25   30

His Val His Ser Ser Phe Ile Tyr Arg Arg Leu Arg Asn His Glu Arg
        35   40   45

Arg Glu Ile Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu Pro His Arg
     50   55   60

Pro Arg Pro Phe Ser Pro Gly Lys Gln Ala Ser Ser Ala Pro Leu Phe
65   70   75   80

Met Leu Asp Leu Tyr Asn Ala Met Thr Asn Glu Glu Asn Pro Glu Glu
           85   90   95

Ser Glu Tyr Ser Val Arg Ala Ser Leu Ala Glu Glu Thr Arg Gly Ala
         100   105   110

Arg Lys Gly Tyr Pro Ala Ser Pro Asn Gly Tyr Pro Arg Arg Ile Gln
         115   120   125

Leu Ser Arg Thr Thr Pro Leu Thr Thr Gln Ser Pro Pro Leu Ala Ser
     130   135   140

Leu His Asp Thr Asn Phe Leu Asn Asp Ala Asp Met Val Met Ser Phe
145   150   155   160

Val Asn Leu Val Glu Arg Asp Lys Asp Phe Ser His Gln Arg Arg His
         165   170   175

Tyr Lys Glu Phe Arg Phe Asp Leu Thr Gln Ile Pro His Gly Glu Ala
        180   185   190

Val Thr Ala Ala Glu Phe Arg Ile Tyr Lys Asp Arg Ser Asn Asn Arg
        195   200   205

Phe Glu Asn Glu Thr Ile Lys Ile Ser Ile Tyr Gln Ile Ile Lys Glu
    210   215   220

Tyr Thr Asn Arg Asp Ala Asp Leu Phe Leu Leu Asp Thr Arg Lys Ala
225   230   235   240

Gln Ala Leu Asp Val Gly Trp Leu Val Phe Asp Ile Thr Val Thr Ser
            245   250   255

Asn His Trp Val Ile Asn Pro Gln Asn Asn Leu Gly Leu Gln Leu Cys
            260   265   270

Ala Glu Thr Gly Asp Gly Arg Ser Ile Asn Val Lys Ser Ala Gly Leu
            275   280   285

Val Gly Arg Gln Gly Pro Gln Ser Lys Gln Pro Phe Met Val Ala Phe
    290   295   300

Phe Lys Ala Ser Glu Val Leu Leu Arg Ser Val Arg Ala Ala Asn Lys
305   310   315   320

Arg Lys Asn Gln Asn Arg Asn Lys Ser Ser Ser His Gln Asp Ser Ser
            325   330   335

Arg Met Ser Ser Val Gly Asp Tyr Asn Thr Ser Glu Gln Lys Gln Ala
            340   345   350

Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln
        355   360   365

Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Phe Tyr Cys Asp Gly
    370   375   380

Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala
385   390   395   400

Ile Val Gln Thr Leu Val His Leu Met Phe Pro Asp His Val Pro Lys
            405   410   415

```
Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe
        420             425             430


Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val
        435             440             445


Arg Ser Cys Gly Cys His
    450
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<210> 16
<211> 513
<212> PRT
<213> Homo sapiens

<400> 16

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Met Pro Gly Leu Gly Arg Arg Ala Gln Trp Leu Cys Trp Trp Trp Gly
1               5                   10              15


Leu Leu Cys Ser Cys Cys Gly Pro Pro Pro Leu Arg Pro Pro Leu Pro
        20              25              30


Ala Ala Ala Ala Ala Ala Ala Gly Gly Gln Leu Leu Gly Asp Gly Gly
        35              40              45


Ser Pro Gly Arg Thr Glu Gln Pro Pro Ser Pro Gln Ser Ser Ser
    50              55              60


Gly Phe Leu Tyr Arg Arg Leu Lys Thr Gln Glu Lys Arg Glu Met Gln
65              70              75              80


Lys Glu Ile Leu Ser Val Leu Gly Leu Pro His Arg Pro Arg Pro Leu
                85              90              95


His Gly Leu Gln Gln Pro Gln Pro Pro Ala Leu Arg Gln Gln Glu Glu
            100             105             110


Gln Gln Gln Gln Gln Gln Leu Pro Arg Gly Glu Pro Pro Pro Gly Arg
            115             120             125


Leu Lys Ser Ala Pro Leu Phe Met Leu Asp Leu Tyr Asn Ala Leu Ser
    130             135             140


Ala Asp Asn Asp Glu Asp Gly Ala Ser Glu Gly Glu Arg Gln Gln Ser
145             150             155             160
```

Trp Pro His Glu Ala Ala Ser Ser Ser Gln Arg Arg Gln Pro Pro Pro
              165   170   175

Gly Ala Ala His Pro Leu Asn Arg Lys Ser Leu Leu Ala Pro Gly Ser
              180   185   190

Gly Ser Gly Gly Ala Ser Pro Leu Thr Ser Ala Gln Asp Ser Ala Phe
              195   200   205

Leu Asn Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu Tyr
    210   215   220

Asp Lys Glu Phe Ser Pro Arg Gln Arg His His Lys Glu Phe Lys Phe
225   230   235   240

Asn Leu Ser Gln Ile Pro Glu Gly Glu Val Val Thr Ala Ala Glu Phe
              245   250   255

Arg Ile Tyr Lys Asp Cys Val Met Gly Ser Phe Lys Asn Gln Thr Phe
              260   265   270

Leu Ile Ser Ile Tyr Gln Val Leu Gln Glu His Gln His Arg Asp Ser
              275   280   285

Asp Leu Phe Leu Leu Asp Thr Arg Val Val Trp Ala Ser Glu Glu Gly
    290   295   300

Trp Leu Glu Phe Asp Ile Thr Ala Thr Ser Asn Leu Trp Val Val Thr
305   310   315   320

Pro Gln His Asn Met Gly Leu Gln Leu Ser Val Val Thr Arg Asp Gly
              325   330   335

Val His Val His Pro Arg Ala Ala Gly Leu Val Gly Arg Asp Gly Pro
              340   345   350

Tyr Asp Lys Gln Pro Phe Met Val Ala Phe Phe Lys Val Ser Glu Val
              355   360   365

His Val Arg Thr Thr Arg Ser Ala Ser Ser Arg Arg Arg Gln Gln Ser
    370   375   380

Arg Asn Arg Ser Thr Gln Ser Gln Asp Val Ala Arg Val Ser Ser Ala
385   390   395   400

```
Ser Asp Tyr Asn Ser Ser Glu Leu Lys Thr Ala Cys Arg Lys His Glu
            405                 410                 415

Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala
            420                 425                 430

Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser Phe Pro
        435                 440                 445

Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu
    450                 455                 460

Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys Ala Pro
465             470                 475                 480

Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn
            485                 490                 495

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys
            500                 505                 510

His
```

```
<210>  17
<211>  1822
<212>  DNA
<213>  Homo sapiens

<400>  17
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tcactgcgag ctgcggcgcc gcacagcttc gtggcgctct gggcacccct gttcctgctg   120

cgctccgccc tggccgactt cagcctggac aacgaggtgc actcgagctt catccaccgg   180

cgcctccgca gccaggagcg gcgggagatg cagcgcgaga tcctctccat tttgggcttg   240

ccccaccgcc cgcgcccgca cctccagggc aagcacaact cggcacccat gttcatgctg   300

gacctgtaca acgccatggc ggtggaggag ggcggcgggc ccggcggcca gggcttctcc   360

tacccctaca aggccgtctt cagtacccag gcccccctc tggccagcct gcaagatagc    420

catttcctca ccgacgccga catggtcatg agcttcgtca acctcgtgga acatgacaag   480

gaattcttcc acccacgcta ccaccatcga gagttccggt ttgatctttc caagatccca   540

gaaggggaag ctgtcacggc agccgaattc cggatctaca aggactacat ccgggaacgc   600

ttcgacaatg agacgttccg gatcagcgtt tatcaggtgc tccaggagca cttgggcagg   660
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gaatcggatc tcttcctgct cgacagccgt accctctggg cctcggagga gggctggctg   720

gtgtttgaca tcacagccac cagcaaccac tgggtggtca atccgcggca caacctgggc   780

ctgcagctct cggtggagac gctggatggg cagagcatca accccaagtt ggcgggcctg   840

attgggcggc acgggcccca gaacaagcag cccttcatgg tggctttctt caaggccacg   900

gaggtccact tccgcagcat ccggtccacg gggagcaaac agcgcagcca gaaccgctcc   960

aagacgccca agaaccagga agccctgcgg atggccaacg tggcagagaa cagcagcagc   1020

gaccagaggc aggcctgtaa gaagcacgag ctgtatgtca gcttccgaga cctgggctgg   1080

caggactgga tcatcgcgcc tgaaggctac gccgcctact actgtgaggg ggagtgtgcc   1140.

ttccctctga actcctacat gaacgccacc aaccacgcca tcgtgcagac gctggtccac   1200

ttcatcaacc cggaaacggt gcccaagccc tgctgtgcgc ccacgcagct caatgccatc   1260

tccgtcctct acttcgatga cagctccaac gtcatcctga agaaatacag aaacatggtg   1320

gtccgggcct gtggctgcca ctagctcctc cgagaattca gaccctttgg ggccaagttt   1380

ttctggatcc tccattgctc gccttggcca ggaaccagca gaccaactgc cttttgtgag   1440

accttcccct ccctatcccc aactttaaag gtgtgagagt attaggaaac atgagcagca   1500

tatggctttt gatcagtttt tcagtggcag catccaatga acaagatcct acaagctgtg   1560

caggcaaaac ctagcaggaa aaaaaaacaa cgcataaaga aaatggccg ggccaggtca   1620

ttggctggga agtctcagcc atgcacggac tcgtttccag aggtaattat gagcgcctac   1680

cagccaggcc acccagccgt gggaggaagg gggcgtggca aggggtgggc acattggtgt   1740

ctgtgcgaaa ggaaaattga cccggaagtt cctgtaataa atgtcacaat aaaacgaatg   1800

aatgaaaaaa aaaaaaaaaa aa   1822

<210>   18
<211>   1873
<212>   DNA
<213>   Mus musculus

<400>   18
ctgcagcaag tgacctcggg tcgtggaccg ctgccctgcc ccctccgctg ccacctgggg   60

cggcgcgggc ccggtgcccc ggatcgcgcg tagagccggc gcgatgcacg tgcgctcgct   120

gcgcgctgcg gcgccacaca gcttcgtggc gctctgggcg cctctgttct tgctgcgctc   180

cgccctggcc gatttcagcc tggacaacga ggtgcactcc agcttcatcc accggcgcct   240

ccgcagccag gagcggcggg agatgcagcg ggagatcctg tccatcttag ggttgcccca   300

tcgcccgcgc ccgcacctcc agggaaagca taattcggcg cccatgttca tgttggacct   360

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gtacaacgcc atggcggtgg aggagagcgg gccggacgga cagggcttct cctaccccta      420

caaggccgtc ttcagtaccc agggcccccc tttagccagc ctgcaggaca gccatttcct      480

cactgacgcc gacatggtca tgagcttcgt caacctagtg aacatgaca aagaattctt       540

ccaccctcga taccaccatc gggagttccg gtttgatctt tccaagatcc ccgagggcga      600

acgggtgacc gcagccgaat tcaggatcta taaggactac atccgggagc gatttgacaa      660

cgagaccttc cagatcacag tctatcaggt gctccaggag cactcaggca gggagtcgga      720

cctcttcttg ctggacagcc gcaccatctg ggcttctgag gagggctggt tggtgtttga      780

tatcacagcc accagcaacc actgggtggt caaccctcgg cacaacctgg gcttacagct      840

ctctgtggag accctggatg ggcagagcat caaccccaag ttggcaggcc tgattggacg      900

gcatggaccc cagaacaagc aacccttcat ggtggccttc ttcaaggcca cggaagtcca      960

tctccgtagt atccggtcca cgggggggcaa gcagcgcagc cagaatcgct ccaagacgcc     1020

aaagaaccaa gaggccctga ggatggccag tgtggcagaa aacagcagca gtgaccagag     1080

gcaggcctgc aagaaacatg agctgtacgt cagcttccga gaccttggct ggcaggactg     1140

gatcattgca cctgaaggct atgctgccta ctactgtgag ggagagtgcg ccttccctct     1200

gaactcctac atgaacgcca ccaaccacgc catcgtccag acactggttc acttcatcaa     1260

cccagacaca gtacccaagc cctgctgtgc gcccacccag ctcaacgcca tctctgtcct     1320

ctacttcgac gacagctcta atgtcatcct gaagaagtac agaaacatgg tggtccgggc     1380

ctgtggctgc cactagctct tcctgagacc ctgacctttg cggggccaca cctttccaaa     1440

tcttcgatgt ctcaccatct aagtctctca ctgcccacct tggcgaggag aacagaccaa     1500

cctctcctga gccttccctc acctcccaac cggaagcatg taagggttcc agaaacctga     1560

gcgtgcagca gctgatgagc gcccttttcct tctggcacgt gacggacaag atcctaccag     1620

ctaccacagc aaacgcctaa gagcaggaaa aatgtctgcc aggaaagtgt ccagtgtcca     1680

catggcccct ggcgctctga gtctttgagg agtaatcgca agcctcgttc agctgcagca     1740

gaaggaaggg cttagccagg gtgggcgctg cgtctgtgt tgaagggaaa ccaagcagaa     1800

gccactgtaa tgatatgtca caataaaacc catgaatgaa aaaaaaaaa aaaaaaaaa      1860

aaaaaaagaa ttc                                                       1873
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<210> 19
<211> 430
<212> PRT
<213> Mus musculus

<400> 19

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala
1   5   10   15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser
              20   25   30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser
          35   40   45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu
      50   55   60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro
65   70   75   80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly
              85   90   95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr
          100   105   110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp
          115   120   125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu
      130   135   140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser
145   150   155   160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr
              165   170   175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr
          180   185   190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe
          195   200   205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val
      210   215   220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His
225   230   235   240

```
Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile
            245                     250                 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys
            260                     265                 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg
            275                     280                 285

Ser Ile Arg Ser Thr Gly Gly Lys Gln Arg Ser Gln Asn Arg Ser Lys
    290                     295                 300

Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Ser Val Ala Glu Asn
305                     310                 315                 320

Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val
            325                     330                 335

Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly
            340                     345                 350

Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser
            355                     360                 365

Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe
    370                     375                 380

Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu
385                     390                 395                 400

Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu
            405                     410                 415

Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            420                     425                 430


<210>   20
<211>   1723
<212>   DNA
<213>   Homo sapiens

<400>   20
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gggctggagg gctccctatg agtggcggag acggcccagg aggcgctgga gcaacagctc     120
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ccacaccgca ccaagcggtg gctgcaggag ctcgcccatc gcccctgcgc tgctcggacc   180

gcggccacag ccggactggc gggtacggcg gcgacagagg cattggccga gagtcccagt   240

ccgcagagta gccccggcct cgaggcggtg gcgtcccggt cctctccgtc caggagccag   300

gacaggtgtc gcgcggcggg gctccaggga ccgcgcctga ggccggctgc ccgcccgtcc   360

cgccccgccc cgccgcccgc cgcccgccga gcccagcctc cttgccgtcg gggcgtcccc   420

aggccctggg tcggccgcgg agccgatgcg cgcccgctga gcgccccagc tgagcgcccc   480

cggcctgcca tgaccgcgct ccccggcccg ctctggctcc tgggcctggc gctatgcgcg   540

ctgggcgggg gcggccccgg cctgcgaccc ccgcccggct gtccccagcg acgtctgggc   600

gcgcgcgagc gccgggacgt gcagcgcgag atcctggcgg tgctcgggct gcctgggcgg   660

ccccggcccc gcgcgccacc cgccgcctcc cggctgcccg cgtccgcgcc gctcttcatg   720

ctggacctgt accacgccat ggccggcgac gacgacgagg acggcgcgcc cgcggagcgg   780

cgcctgggcc gcgccgacct ggtcatgagc ttcgttaaca tggtggagcg agaccgtgcc   840

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aacaggaccc tccacgtcag catgttccag gtggtccagg agcagtccaa cagggagtct   1020

gacttgttct ttttggatct tcagacgctc cgagctggag acgagggctg gctggtgctg   1080

gatgtcacag cagccagtga ctgctggttg ctgaagcgtc acaaggacct gggactccgc   1140

ctctatgtgg agactgagga cgggcacagc gtggatcctg gcctggccgg cctgctgggt   1200

caacgggccc cacgctccca acagcctttc gtggtcactt tcttcagggc cagtccgagt   1260

cccatccgca cccctcgggc agtgaggcca ctgaggagga ggcagccgaa gaaaagcaac   1320

gagctgccgc aggccaaccg actcccaggg atctttgatg acgtccacgg ctcccacggc   1380

cggcaggtct gccgtcggca cgagctctac gtcagcttcc aggacctcgg ctggctggac   1440

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ctggactcct gcatgaatgc caccaaccac gccatcctgc agtccctggt gcacctgatg   1560

aagccaaacg cagtccccaa ggcgtgctgt gcacccacca agctgagcgc cacctctgtg   1620

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gcctgcggct gccactgagt cagcccgccc agccctactg cag   1723

<400> 21

Met Thr Ala Leu Pro Gly Pro Leu Trp Leu Leu Gly Leu Ala Leu Cys
1   5   10   15

Ala Leu Gly Gly Gly Gly Pro Gly Leu Arg Pro Pro Pro Gly Cys Pro
          20   25   30

Gln Arg Arg Leu Gly Ala Arg Glu Arg Arg Asp Val Gln Arg Glu Ile
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Leu Ala Val Leu Gly Leu Pro Gly Arg Pro Arg Pro Arg Ala Pro Pro
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Ala Ala Ser Arg Leu Pro Ala Ser Ala Pro Leu Phe Met Leu Asp Leu
65   70   75   80

Tyr His Ala Met Ala Gly Asp Asp Asp Glu Asp Gly Ala Pro Ala Glu
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Arg Arg Leu Gly Arg Ala Asp Leu Val Met Ser Phe Val Asn Met Val
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Glu Arg Asp Arg Ala Leu Gly His Gln Glu Pro His Trp Lys Glu Phe
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Arg Phe Asp Leu Thr Gln Ile Pro Ala Gly Glu Ala Val Thr Ala Ala
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Glu Phe Arg Ile Tyr Lys Val Pro Ser Ile His Leu Leu Asn Arg Thr
145   150   155   160

Leu His Val Ser Met Phe Gln Val Val Gln Glu Gln Ser Asn Arg Glu
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Ser Asp Leu Phe Phe Leu Asp Leu Gln Thr Leu Arg Ala Gly Asp Glu
          180   185   190

Gly Trp Leu Val Leu Asp Val Thr Ala Ala Ser Asp Cys Trp Leu Leu
          195   200   205

Lys Arg His Lys Asp Leu Gly Leu Arg Leu Tyr Val Glu Thr Glu Asp
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Gly His Ser Val Asp Pro Gly Leu Ala Gly Leu Leu Gly Gln Arg Ala
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Pro Arg Ser Gln Gln Pro Phe Val Val Thr Phe Phe Arg Ala Ser Pro
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Ser Pro Ile Arg Thr Pro Arg Ala Val Arg Pro Leu Arg Arg Arg Gln
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Pro Lys Lys Ser Asn Glu Leu Pro Gln Ala Asn Arg Leu Pro Gly Ile
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Phe Asp Asp Val His Gly Ser His Gly Arg Gln Val Cys Arg Arg His
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Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Leu Asp Trp Val Ile
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Ala Pro Gln Gly Tyr Ser Ala Tyr Tyr Cys Glu Gly Glu Cys Ser Phe
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Pro Leu Asp Ser Cys Met Asn Ala Thr Asn His Ala Ile Leu Gln Ser
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Leu Val His Leu Met Lys Pro Asn Ala Val Pro Lys Ala Cys Cys Ala
        355   360   365

Pro Thr Lys Leu Ser Ala Thr Ser Val Leu Tyr Tyr Asp Ser Ser Asn
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Asn Val Ile Leu Arg Lys His Arg Asn Met Val Val Lys Ala Cys Gly
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gcacccaccc gctcaacaca accctccaca tcagcatgtt cgaagtggtc caagagcact      600

ccaacaggga gtctgacttg ttcttttttgg atcttcagac gctccgatct ggggacgagg      660

gctggctggt gctggacatc acagcagcca gtgaccgatg gctgctgaac catcacaagg      720

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caaagaaaac gaacgagctt ccgcacccca acaaactccc agggatcttt gatgatggcc      960

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tctgcaccat tcattgtggc agttgggaca tttttaggta taacagacac atacacttag     1740

atcaatgcat cgctgtactc cttgaaatca gagctagctt gttagaaaaa gaatcagagc     1800

caggtatagc ggtgcatgtc attaatccca gcgctaaaga gacagagaca ggagaatctc     1860

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Ala Val Leu Gly Leu Pro Gly Arg Pro Arg Pro Arg Ala Gln Pro Ala
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Ala Ala Arg Gln Pro Ala Ser Ala Pro Leu Phe Met Leu Asp Leu Tyr
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His Ala Met Thr Asp Asp Asp Gly Gly Pro Pro Gln Ala His Leu
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Gly Arg Ala Asp Leu Val Met Ser Phe Val Asn Met Val Glu Arg Asp
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Arg Thr Leu Gly Tyr Gln Glu Pro His Trp Lys Glu Phe His Phe Asp
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Leu Thr Gln Ile Pro Ala Gly Glu Ala Val Thr Ala Ala Glu Phe Arg
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Ile Tyr Lys Glu Pro Ser Thr His Pro Leu Asn Thr Thr Leu His Ile
145                 150                 155                 160


Ser Met Phe Glu Val Val Gln Glu His Ser Asn Arg Glu Ser Asp Leu
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Phe Phe Leu Asp Leu Gln Thr Leu Arg Ser Gly Asp Glu Gly Trp Leu
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Val Leu Asp Ile Thr Ala Ala Ser Asp Arg Trp Leu Leu Asn His His
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Lys Asp Leu Gly Leu Arg Leu Tyr Val Glu Thr Ala Asp Gly His Ser
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Met Asp Pro Gly Leu Ala Gly Leu Leu Gly Arg Gln Ala Pro Arg Ser
225   230   235   240

Arg Gln Pro Phe Met Val Thr Phe Phe Arg Ala Ser Gln Ser Pro Val
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Arg Ala Pro Arg Ala Ala Arg Pro Leu Lys Arg Arg Gln Pro Lys Lys
                260   265   270

Thr Asn Glu Leu Pro His Pro Asn Lys Leu Pro Gly Ile Phe Asp Asp
        275   280   285

Gly His Gly Ser Arg Gly Arg Glu Val Cys Arg Arg His Glu Leu Tyr
    290   295   300

Val Ser Phe Arg Asp Leu Gly Trp Leu Asp Trp Val Ile Ala Pro Gln
305   310   315   320

Gly Tyr Ser Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asp
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Ser Cys Met Asn Ala Thr Asn His Ala Ile Leu Gln Ser Leu Val His
            340   345   350

Leu Met Lys Pro Asp Val Val Pro Lys Ala Cys Cys Ala Pro Thr Lys
        355   360   365

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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Xaa Xaa Xaa
        35   40   45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Cys Xaa Pro
    50   55   60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1   5   10   15

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Xaa Xaa Xaa Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Gly
          20                  25                  30


Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
          35                  40                  45


Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    50                  55                  60


Xaa Xaa Cys Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa
65                  70                  75                  80


Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
              85                  90                  95


Xaa Xaa Cys Xaa Cys Xaa
          100
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multiple species

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<223> Xaa at res. 3 is (Lys or Arg)

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<223> Xaa at res. 11 is (Arg or Gln)

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<223> Xaa at res. 16 is (Gln or Leu)

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<223> Xaa. at res. 19 is (Ile or Val)

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<223> Xaa at res. 52 is (Ser or Thr)

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<223> Xaa at res. 56 is (Phe or Leu)

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<223> Xaa at res. 57 is (Ile or Met)



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<223> Xaa at res. 60 is (Glu, Asp or Asn)


<221>    VARIANT
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<223> Xaa at res. 61 is (Thr, Ala or Val)

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Cys Xaa Xaa His Glu Leu Tyr Val Ser Phe Xaa Asp Leu Gly Trp Xaa
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Asp Trp Xaa Ile Ala Pro Xaa Gly Tyr Xaa Ala Tyr Tyr Cys Glu Gly
            20   25   30

Glu Cys Xaa Phe Pro Leu Xaa Ser Xaa Met Asn Ala Thr Asn His Ala
        35   40   45

Ile Xaa Gln Xaa Leu Val His Xaa Xaa Xaa Pro Xaa Xaa Val Pro Lys
    50   55   60

Xaa Cys Cys Ala Pro Thr Xaa Leu Xaa Ala Xaa Ser Val Leu Tyr Xaa
65   70   75   80

Asp Xaa Ser Xaa Asn Val Ile Leu Xaa Lys Lys Arg Asn Met Val Xaa
            85   90   95

Ala Cys Gly Cys His
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<210> 31
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<400> 31

Gly Gly Pro Pro
1